What is claimed is:

1. A fuel cell separator that has a substrate made of a first metal, comprising:

a metal layer formed on a surface of the substrate, the metal layer being made of a second metal that is different from the first metal in composition;

a conductive porous layer formed on a surface of the metal layer, the conductive porous layer being made up of a plurality of conductive particles which are fusion-bonded to each other; and

an oxide film formed on parts of the surface of the metal layer that do not come into contact with the conductive particles, the oxide film having a higher corrosion resistance than the substrate.

2. The fuel cell separator of Claim 1,

wherein the oxide film is formed by oxidizing the metal layer, so that the oxide film is oxidized by a greater degree than a surface of the metal layer at an interface between the conductive particles and the metal layer.

3. The fuel cell separator of Claim 1,

wherein the metal layer is made of a material that has a

higher conductivity than the substrate.

4. The fuel cell separator of Claim 1, wherein the conductive porous layer is made of a material that has a higher conductivity than the substrate.

5. The fuel cell separator of Claim 4, wherein ribs and channels are formed on at least one principal surface of the substrate, and the conductive porous layer is adhered to upper surfaces of the ribs.

6. The fuel cell separator of Claim 1, wherein the first metal is selected from the group consisting of stainless steel, aluminum and aluminum alloy.

7. The fuel cell separator of Claim 1, wherein the second metal is one of Cr and a Cr alloy containing at least 20wt% of Cr.

8. The fuel cell separator of Claim 7, wherein the Cr alloy contains at least one element selected from the group consisting of Ni, Ti, Nb, Au and Pt.

9. The fuel cell separator of Claim 1,

wherein the conductive porous layer is made of a metal containing at least one element selected from the group consisting of Ni, Ti, Nb, Au and Pt.

10. A fuel cell having an anode on one surface of an electrolytic film, a cathode on a remaining surface of the electrolytic film, a separator being opposed to the anode, and a separator being opposed to the cathode, wherein the fuel cell generates power from a fuel and an oxidizer when the fuel is distributed along a surface of the separator facing the anode and the oxidizer is distributed along a surface of the separator facing the cathode,

wherein the separator is any one of the fuel cell separators of Claims 1 to 9.

11. A manufacturing method for a fuel cell separator having a metal substrate, comprising:

a metal layer forming step for forming a metal layer on a surface of the substrate, the metal layer serving as an oxide film that has a higher corrosion resistance than the substrate;

a conductive layer forming step for forming a porous conductive layer on a surface of the metal layer, the porous conductive layer being made up of a plurality of conductive particles which are fusion-bonded to each other, the plurality

of conductive particles having a higher conductivity than the substrate;

an oxidizing step for oxidizing exposed parts of the surfaces of the metal layer and the conductive particles; and

a removing step for removing oxides from the exposed parts of the surfaces of the conductive particles.

12. The manufacturing method of Claim 11,

wherein the metal layer forming step produces the metal layer by physical vapor deposition.

13. The manufacturing method of Claim 12,

wherein a target substance used for the physical vapor deposition has a higher corrosion resistance than the substrate when it is oxidized.

14. The manufacturing method of Claim 11,

wherein the conductive layer forming step produces the porous conductive layer by physical vapor deposition.

15. The manufacturing method of any one of Claims 12 to 14,

wherein the physical vapor deposition is an arc ion plating method.

16. The manufacturing method of Claim 11, wherein the removing step includes the usage of an arc ion plating apparatus to remove the oxides by performing bombardment with an inert gas.